Risk Assessment Workplan
Wellman Dynamics Corporation
Creston, Iowa
USEPA ID No. IAD065218737
Revision 2

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TABLE OF CONTENTS

FIGURES

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1.0 INTRODUCTION

1.1 Purpose

This Risk Assessment Workplan (RAW) has been prepared for the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) of the Wellman Dynamics Corporation (WDC) facility. The RAW represents a portion of the RFI Workplan for the WDC facility.

The purpose of the Risk Assessment is to evaluate risks to human health and the environment associated with contaminant releases from the WDC facility. The Risk Assessment will provide the basis for determining whether or not correctives measures are necessary and, if necessary, will facilitate the selection of measures to reduce risk.

The RFI Workplan and RAW were prepared in accordance with the requirements of the Administrative Order on Consent (Order) issued by the United States Environmental Protection Agency (USEPA) that became effective on January 23, 2004.

1.2 RFI Workplan Organization

This RAW is one of six documents that compose the WDC RFI Workplan. The other five Workplan component documents include:

- Project Management Plan
- Sampling and Analysis Plan/Quality Assurance Project Plan (SAP/QAPP)
- Data Management Plan
- Health and Safety Plan
- Community Relations Plan

These component documents reference each other and should be reviewed in combination to obtain a complete understanding of the proposed RFI.

2.0 RISK ASSESSMENT OBJECTIVES

The Risk Assessment will evaluate risks to human health and the environment and will provide the basis for determining whether or not remedial action is necessary. The Risk Assessment will be performed in

accordance with Risk Assessment Guidance for Superfund (RAGS), as appropriate to the RFI. In particular, the guidance documents will include:

- U.S. EPA. 1989. Risk Assessment Guidance for Superfund (RAGS): Volume 1: Human Health Evaluations Manual (HHEM). Part A. Interim Final. Office of Emergency and Remedial Response, Washington, DC. EPA/540/1-89-002.
- U.S. EPA. 1991. Risk Assessment Guidance for Superfund (RAGS): Volume 1: Human Health Evaluations Manual (HHEM). Part B, Development of Risk-Based Preliminary Remediation Goals. Office of Emergency and Remedial Response, Washington, DC. Publication 9285.7-01B.
- U.S. EPA. 1996a. Soil Screening Guidance: User's Guide. Office of Emergency and Remedial Response, Washington, DC. EPA/540/R-96/018.
- U.S. EPA. 1996b. Soil Screening Guidance: Technical Background Document. Office of Emergency and Remedial Response, Washington, DC. EPA/540/R-96/128.
- U.S. EPA. 1998. Guidelines for Ecological Risk Assessment. Risk Assessment Forum, Washington, DC, EPA/630/R095/002F.
- U.S. EPA. 2000. Ecological Soil Screening Levels (Eco-SSLs). www.epa.gov/superfund/programs/risk/ecorisk/ecossl.htm.

The equations, parameters, and other information used to estimate health risks will be prepared in a tabular format that is consistent with RAGS Volume 1 – Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments).

The potential receptors, transport mechanisms, media pathways, and potential exposure pathways identified in the Final Current Conditions Report (CCR) and the RFI activities will be evaluated in the Risk Assessment. Finally, the Risk Assessment will identify Preliminary Remediation Goals (PRGs) including groundwater cleanup goals for the compliance boundary (the property boundary) based on reasonable off-site exposure scenarios.

3.0 RISK ASSESSMENT COMPONENTS

The Risk Assessment process for this site is divided into six components. They are: hazard identification, exposure assessment, toxicity assessment, risk characterization, environmental evaluation, and development of preliminary remediation goals. An outline of the completion of these components is

presented below. These components will be completed in accordance with the USEPA guidance documents listed above.

3.1 Hazard Identification

The hazard identification portion of the Risk Assessment will combine the information on detected chemicals presented in the Final CCR with the data collected for this RFI Workplan. Based on both sets of data, the hazard identification will result in a list of contaminants of potential concern (COPCs) for this site. The contaminants of potential concern will be listed by media in the various solid waste management units (SWMUs) and areas of concern (AOCs) identified in the Final CCR and RFI Report. Chemicals detected at concentrations below risk-based screening levels will be excluded from the COPC list. Risk-based screening levels will be based on USEPA Region 9 Preliminary Remediation Goals or other appropriate sources. Carcinogens will be screened at a cancer risk level of $1x10^{-6}$ and non-carcinogens will be screened at a hazard quotient of 0.1 to account for potential additivity of non-cancer health effects. Maximum Contaminant Levels (MCLs) will not be used for screening. The rationale for inclusion or exclusion of chemicals from the COPC list will be contained in the hazard identification portion of the Risk Assessment.

The output of the hazard identification will be tables of COPCs for each of the SWMUs that include minimum and maximum concentrations, frequencies of detection, and comparisons to background and risk-based screening levels.

3.2 Exposure Assessment

The potential receptors, transport mechanisms, media pathways, and potential exposure pathways have been identified in the Final Current Conditions Report (CCR) and modified based on comments received from USEPA on the draft RFI Workplan. These are summarized on **Figures 1** through **6**. Potential receptors include on-site industrial workers and construction workers and off-site residents and biota. The trespasser scenario will not be included because site security precludes trespassers, per the Final CCR. The future land use of the site is assumed to be the same as the current land use (that is, industrial) per the Order. Possible future uses of groundwater and surface water will be evaluated if the RFI indicates these are potentially completed pathways.

The exposure assessment will document exposure factors and exposure concentrations for the receptors and pathways identified in the CCR and in the RFI. Default exposure factors will be revised, where appropriate, based on site-specific activities. WDC will contact the USEPA Region 7 risk assessment

staff regarding changes to any default exposure factors prior to the submission of the human health risk assessment.

The bases of exposure assumptions will be documented in the exposure assessment. Exposure concentrations will be calculated for the affected media in the SWMUs and AOCs following USEPA guidance for reasonable maximum exposure (RME).

The output of the exposure assessment will be tables of medium-specific estimated exposure concentrations for the COPCs in the individual SWMUs, a presentation of the exposure factors, and tables of estimated daily intake for input into the risk calculations.

3.3 Toxicity Assessment

The toxicity assessment will use the USEPA-recommended toxicity values in the hierarchy proposed in the Office of Solid Waste and Emergency Response (OSWER) Directive 9285.7-53 (December 5, 2003). That is as follows:

- Tier 1 toxicity data will be USEPA's Integrated Risk Information System (IRIS).
- Tier 2 values will be USEPA's Provisional Peer Reviewed Toxicity Values (PPRTVs).
- Tier 3 data will be other toxicity values (including the Health Effects Assessment Summary Tables, state-provided values, etc.).

Per the recommendation of USEPA Region VII risk assessment staff, toxicity values for trichloroethylene will include the upper and lower end of the provisional values along with the previously published value.

3.4 Risk Characterization and Uncertainty Discussion

The risk characterization will integrate the estimated daily intake values for the COPCs from the exposure assessment with the results of the toxicity assessment to calculate estimates of risks to potentially exposed receptors. The risk characterization will include RME estimates of non-carcinogenic risk (hazard index) and of carcinogenic risk, presented for the potential current and future receptors for the individual SWMUs. Risks at the site will be compared to the acceptable risk range of 10^{-6} to 10^{-4}, and the hazard index evaluation for non-carcinogenic toxicity will be compared to 1.0.

The uncertainty discussion will identify and discuss the effects of uncertainties in the risk assessment including those associated with the following: data gaps, estimates of exposure concentrations, the exposure scenarios and exposure factors, and chemical toxicity (including missing toxicity data).

If background concentrations of COPCs exceed risk-based screening levels or contribute significantly to site concentrations above risk-based screening levels, the risk characterization will also include a discussion of elevated background concentrations of COPCs and their contribution to site risks, in accordance with the USEPA guidance document entitled *Role of Background in the CERCLA Cleanup Program*, dated April 2002.

3.5 Environmental Evaluation

Risks to the environment from exposure to site contaminants will be addressed by the Risk Assessment. Per the Order, this will include a brief description of biota in surface water on or adjacent to the Facility, a brief description of the ecology overlying or adjacent to the Facility, and a brief description of any endangered or threatened species at or near the Facility. The site is in industrial land use and the area surrounding the site is agricultural and commercial. The impact of site contaminants on ecological receptors is expected to be low compared to the impact of the industrial and agricultural land uses. This will be documented in the RFI Report and in the Environmental Evaluation and will be supported, where appropriate, by comparisons to ecological screening levels.

3.6 Preliminary Remediation Goals

PRGs are risk-based concentrations that are considered to be health protective of human exposures. The PRGs for this RFI will be calculated using the exposure scenarios and exposure factors identified in the exposure assessment of this Risk Assessment. That is, they will be site-specific PRGs. At a minimum, PRGs will be calculated for the COPCs that are identified as having unacceptable risk at this site and separate PRGs will be calculated for the various exposure scenarios. PRGs for carcinogenic effects for on-site industrial and construction worker scenarios will be based on 10^{-6} incremental excess lifetime cancer risk (IELCR); PRGs for off-site residential exposures will be based on 10^{-6} risk. The USEPA risk manager will determine the appropriate cancer risk level when setting final cleanup levels for carcinogens. PRGs for non-carcinogenic effects will be based on a hazard index of 1.0.

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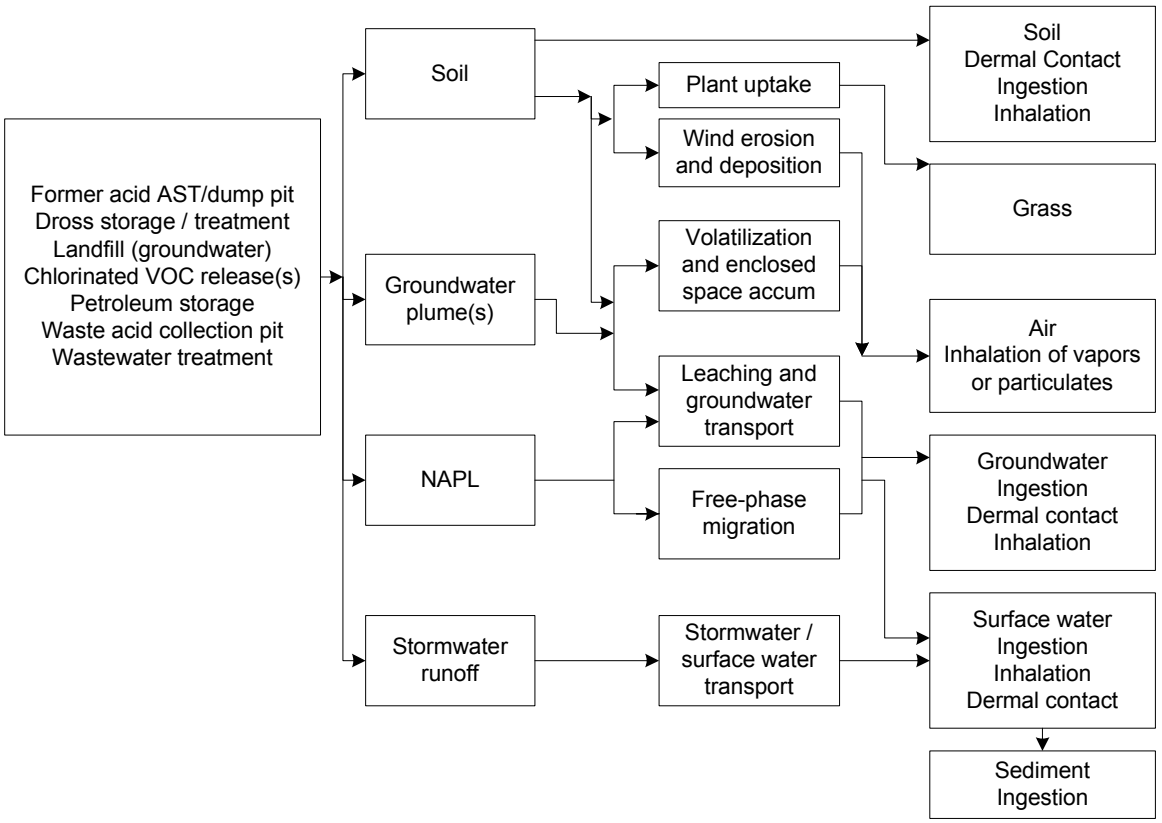
FIGURES

Figure 1
Potential Exposure Pathway Summary
Risk Assessment Workplan
Wellman Dynamics, Creston, Iowa



Potential Receptors Based on Current Data	Receptors with Additional Information Needed
• Industrial • Construction worker	• Residential • Terrestrial Biota
• None	• Terrestrial Biota
• Construction worker	• Residential • Industrial
• Construction worker	• Residential
• None	• Aquatic biota • Terrestrial biota • Residential
• None	• Aquatic biota • Terrestrial biota • Residential

Figure 2
Exposure Pathway Evaluation
Former Chromic Acid AST and Dump Pit Area (SWMUs 4 & 11)
Risk Assessment Workplan
Wellman Dynamics, Creston, Iowa

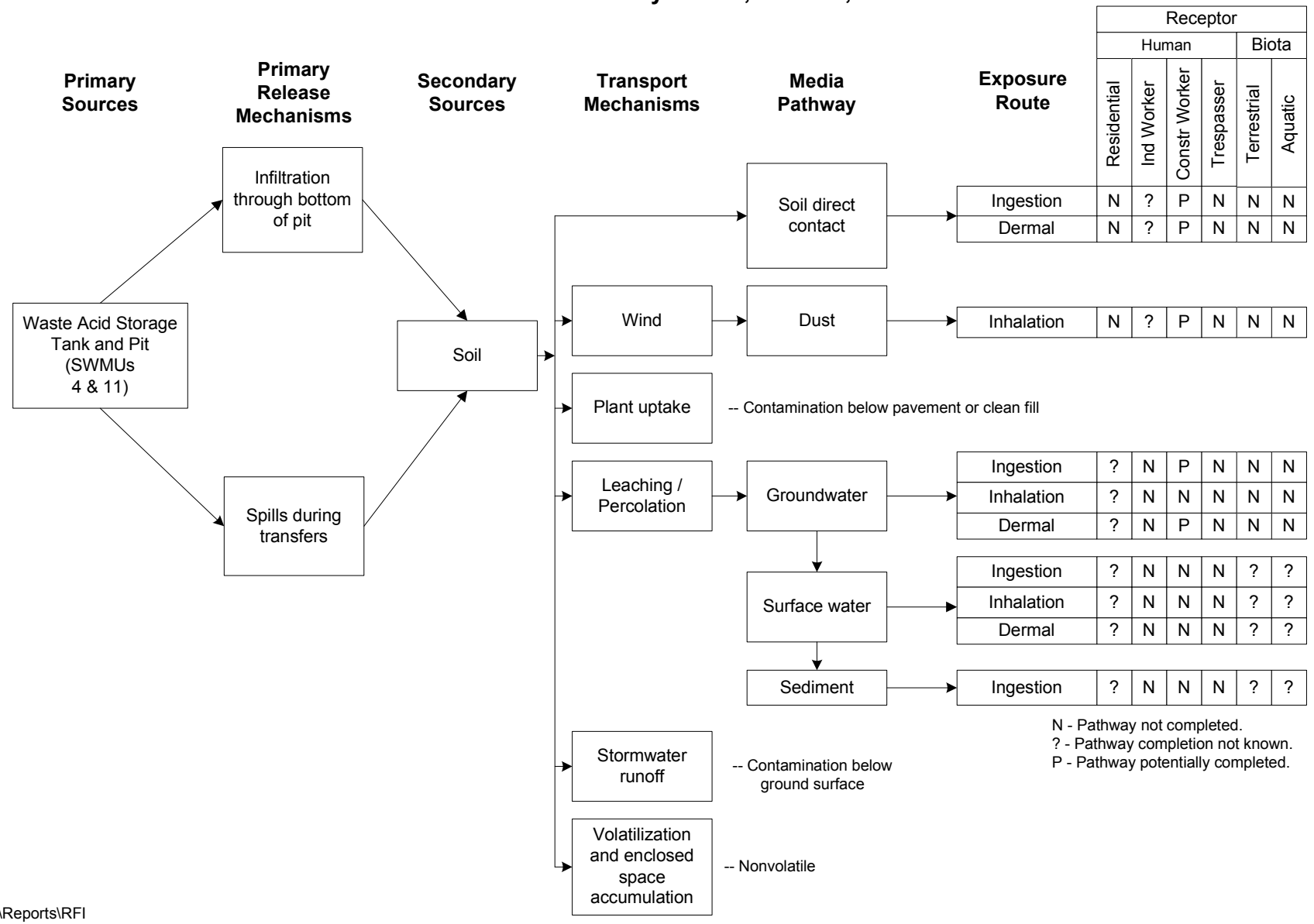
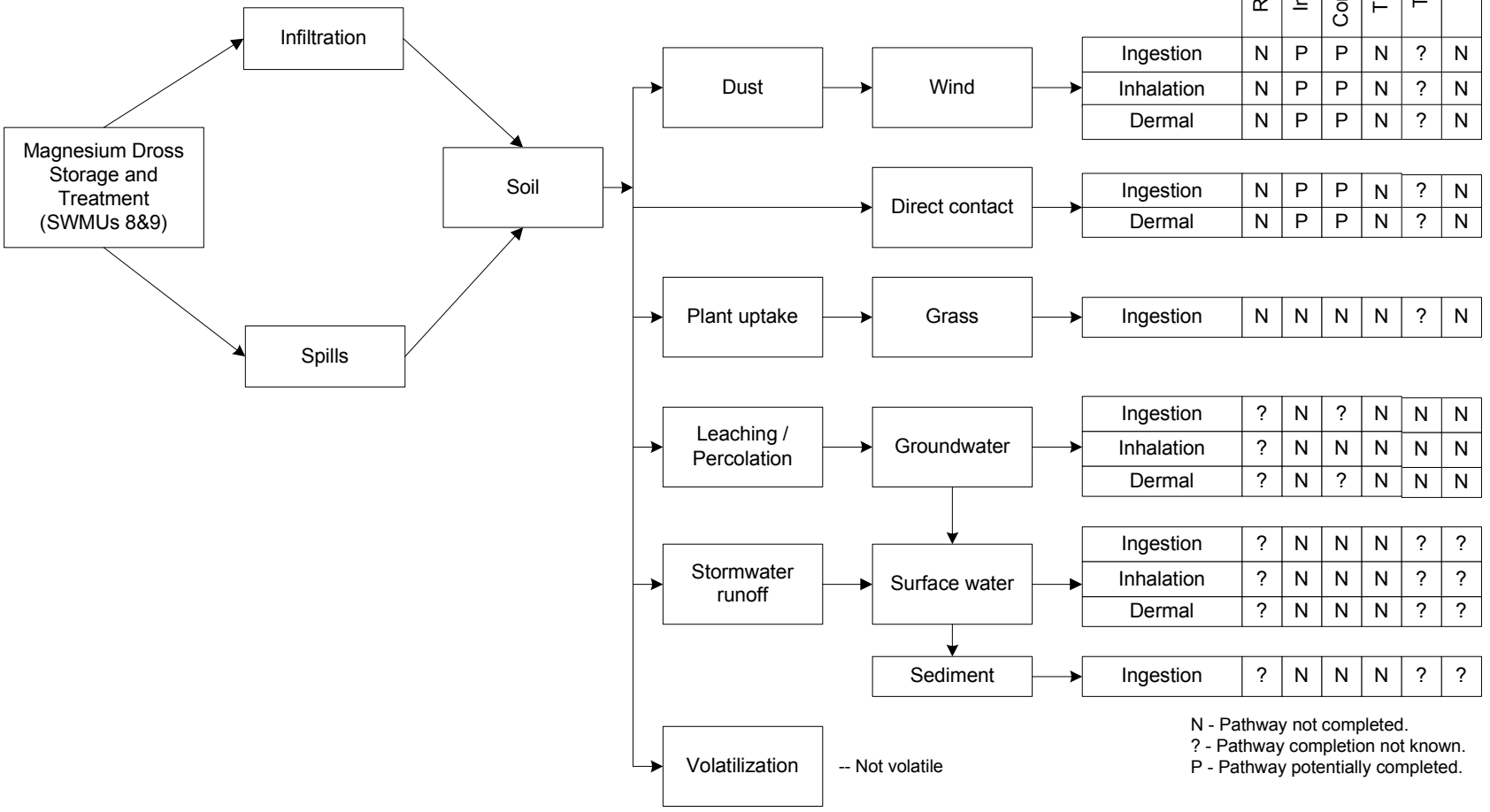


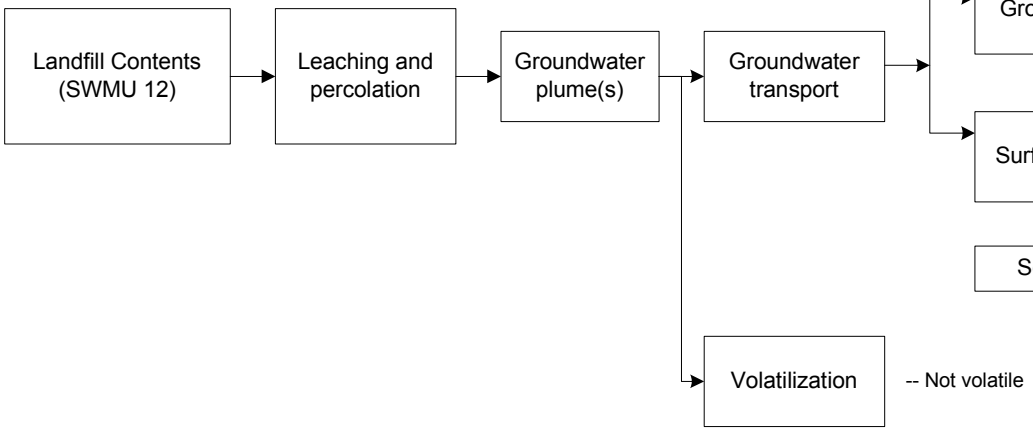
Figure 3
Exposure Pathway Evaluation
Magnesium Dross Storage and Treatment Area (SWMUs 8 & 9)
Risk Assessment Workplan
Wellman Dynamics, Creston, Iowa



Exposure Route	Current: Human: Residential	Ind Worker	Constr Worker	Trespasser	Biota: Terrestrial	Aquatic
Ingestion	N	P	P	N	?	N
Inhalation	N	P	P	N	?	N
Dermal	N	P	P	N	?	N
Ingestion	N	P	P	N	?	N
Dermal	N	P	P	N	?	N
Ingestion	N	N	N	N	?	N
Ingestion	?	N	?	N	N	N
Inhalation	?	N	N	N	N	N
Dermal	?	N	?	N	N	N
Ingestion	?	N	N	N	?	?
Inhalation	?	N	N	N	?	?
Dermal	?	N	N	N	?	?
Ingestion	?	N	N	N	?	?

N - Pathway not completed.
? - Pathway completion not known.
P - Pathway potentially completed.

Figure 4
Exposure Pathway Evaluation
Landfill Groundwater Impact Area (SWMU 12)
Risk Assessment Workplan
Wellman Dynamics, Creston, Iowa

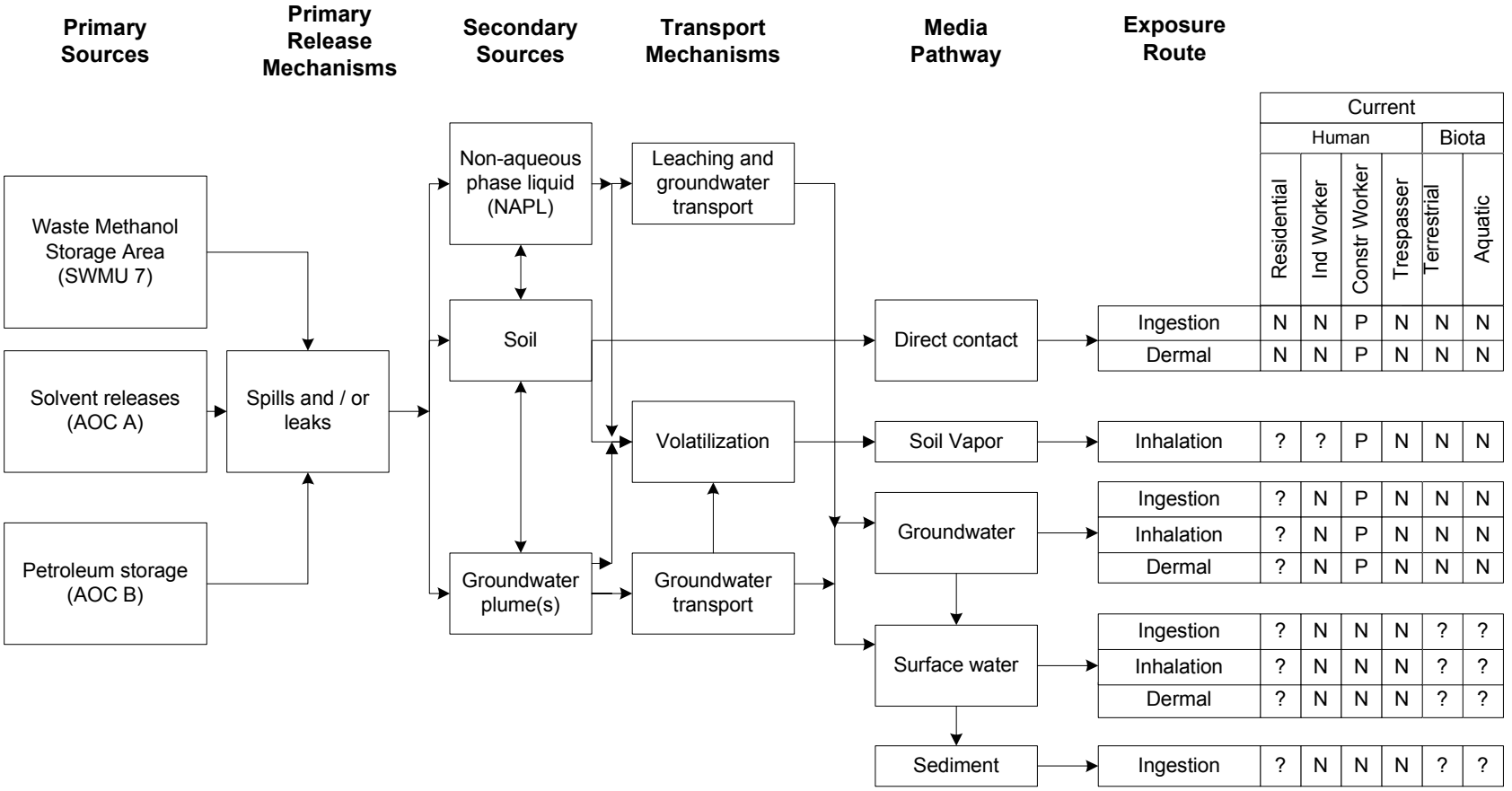


Exposure Route	Current: Human: Residential	Current: Human: Ind Worker	Current: Human: Constr Worker	Current: Human: Trespasser	Current: Biota: Terrestrial	Current: Biota: Aquatic
Groundwater: Ingestion	?	N	P	N	N	N
Groundwater: Inhalation	?	N	N	N	N	N
Groundwater: Dermal	?	N	P	N	N	N
Surface water: Ingestion	?	N	N	N	?	?
Surface water: Inhalation	?	N	N	N	?	?
Surface water: Dermal	?	N	N	N	?	?
Sediment: Ingestion	?	N	N	N	?	?

N - Pathway not completed.
? - Pathway completion not known.
P - Pathway potentially completed.

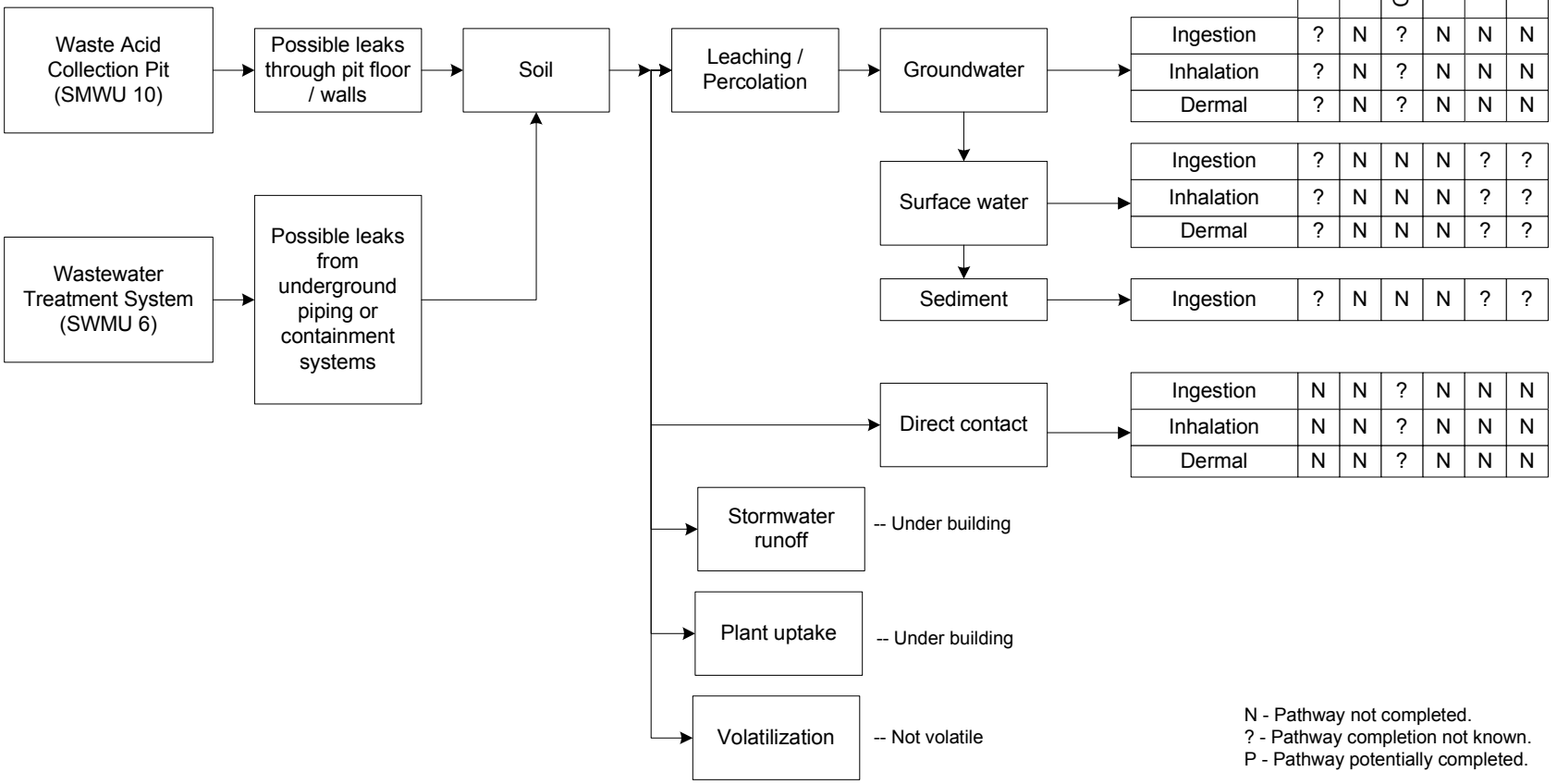
Note: Pathways other than groundwater are not part of the RFI and are addressed under the IDNR sanitary landfill permit program.

Figure 12
Exposure Pathway Evaluation
VOC Release Areas (AOCs A&B and SMWU 7)
Sampling and Analysis Plan / Quality Assurance Project Plan
Wellman Dynamics, Creston, Iowa



N - Pathway not completed.
? - Pathway completion not known.
P - Pathway potentially completed.

Figure 6
Exposure Pathway Evaluation
Wastewater Treatment System and Waste Acid Collection Pit Area (SMWUs 6 & 10)
Risk Assessment Workplan
Wellman Dynamics, Creston, Iowa



Exposure Route	Current: Human: Residential	Ind Worker	Constr Worker	Trespasser	Biota: Terrestrial	Aquatic
Ingestion	?	N	?	N	N	N
Inhalation	?	N	?	N	N	N
Dermal	?	N	?	N	N	N
Ingestion	?	N	N	N	?	?
Inhalation	?	N	N	N	?	?
Dermal	?	N	N	N	?	?
Ingestion	?	N	N	N	?	?
Ingestion	N	N	?	N	N	N
Inhalation	N	N	?	N	N	N
Dermal	N	N	?	N	N	N

N - Pathway not completed.
? - Pathway completion not known.
P - Pathway potentially completed.